DOCUMENT RESUME

ED 446 159 UD 033 672

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TITLE Inequality in the First Year of Primary School. CES Briefing.
INSTITUTION Edinburgh Univ. (Scotland). Centre for Educational Sociology.
REPORT NO CES-B-16
PUB DATE 1999-09-00
NOTE 5p.
PUB TYPE Reports - Evaluative (142)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Academic Achievement; *Disadvantaged Youth; *Early Intervention; *Elementary School Students; Foreign Countries; Literacy; Numeracy; Primary Education; *Student Evaluation
IDENTIFIERS *Scotland

ABSTRACT

In Scotland, the Early Intervention Programme (EIP) aims to raise standards of literacy and numeracy in the first 2 years of primary school with an emphasis on overcoming disadvantage and inequality. As part of this initiative, one local authority, Aberdeen City, has introduced Baseline Assessment on entry to primary school with a follow-up assessment at the end of Primary 1 (P1) stage. Analysis of the assessment data at the beginning and end of P1 makes it possible to evaluate the effectiveness of the EIP. Levels of attainment of literacy and numeracy varied considerably for these students, but their attainment tended to be lower if they were younger than average, had English as a second language, came from relatively poor families, or lived in areas of multiple deprivation. On entry to P1 there was no evidence of gender differences in attainment of literacy or numeracy, but gender differences emerged during P1. By the end of the first year, girls had made more progress in reading and less progress in mathematics than boys. Inequity in literacy increased during P1, and students from disadvantaged backgrounds made less progress than others. Inequality in numeracy decreased during P1, with some evidence of catching up by students who started with relatively low attainment in mathematics. (SLD)

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Inequality in the First Year of Primary School

by Linda Croxford

No. 16, September 1999

Throughout Scotland, the Early Intervention Programme (EIP) aims to raise standards of literacy and numeracy in the first two years of primary school with an emphasis on overcoming disadvantage and inequality. As part of this initiative, one local authority has introduced Baseline Assessment on entry to primary school with a follow-up assessment at the end of the Primary 1 (P1) stage. Analysis of the assessment data at the beginning and end of P1 will enable evaluation of the effectiveness of the EIP. This Briefing reports on some of the issues the EIP will have to address.

- **Levels** of attainment of literacy and numeracy on entry to Primary 1 varied considerably between pupils. Pupils had relatively lower attainment if they: were younger than average; had English as a second language; came from relatively poor home backgrounds; or lived in areas of multiple deprivation.
- **On** entry to P1 there was no evidence of gender differences in attainment of literacy or numeracy.
- **Gender** differences emerged during P1. By the end of their first year in school girls had made more progress in reading and less progress in mathematics than boys.
- **Inequality** in literacy increased in the course of P1. Pupils who had relatively low levels of reading attainment on entry to school made less progress in reading by the end of P1 than those who started with high reading attainment. Pupils from disadvantaged backgrounds made less progress than others.
- **Inequality** in numeracy decreased during P1. There was some evidence of catching-up by pupils who started with relatively low attainment in mathematics. Pupils from disadvantaged backgrounds made as much progress in mathematics as their peers.

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The Early Intervention Programme

In 1996 the *Task Force on Underachievement in Scottish Schools* recommended that the highest priority be given to strengthening the delivery of education in the early years of schooling, with the objective "to overcome by intervention the disadvantages and inequalities of social and domestic background, and to help all children to reach or exceed a minimum level of performance - in language and number especially - by P3" (Scottish Office Education and Industry Department (SOEID) 1996, p1). To meet this objective the SOEID has provided local authorities with £60 million over five years to fund the Early Intervention Programme (EIP). Each authority has been free to decide the balance of intervention activities within its schools, and is responsible for their evaluation. This Briefing reports on the early experiences of EIP in one Scottish local authority, Aberdeen City Council.

The ways in which early intervention strategies have been implemented vary between different local authorities (Fraser *et al* 1999). In some authorities interventions have been targeted at schools in areas of multiple deprivation while in others all schools have been included in the programme.

Aberdeen City has chosen a phased approach that will allow all schools to be included over a three-year period by focusing early intervention in one third of schools in each one-year phase. Schools in each phase include a full range of socio-economic conditions. The main aim of EIP in the authority is to develop methods to improve literacy and numeracy in primary schools that will have long-term widespread effects. Much of the decision making about early intervention has been devolved to schools, and teachers are released from class to work out new methods, extend existing approaches, critically consider different approaches to teaching and learning, and to attend in-service and other staff development activities (Cowie and Croxford 1999).

Baseline Assessment

The introduction of Baseline Assessment has been an important component of EIP. It helps teachers to assess the attainment and needs of their pupils, and is a means of identifying pupils in most need of additional help. It also provides a baseline for evaluating the effectiveness of the EIP. However, Baseline Assessment is not carried out in a standard way in all Scottish primary schools, and a number of different forms of Baseline Assessment have been adopted by local authorities for the purposes of EIP. Consequently, there are no national data on levels of literacy and numeracy on entry to school.

This analysis uses standardised assessments developed by the Performance Indicators in Primary Schools (PIPS) system. The PIPS system assesses reading and mathematics both on entry to P1, and also at the end of P1 to estimate pupils' progress. The data cover all pupils who entered P1 in 1997-98 in all of the schools within Aberdeen City. The data provide a unique source of information about attainment, progress and the extent of inequality in P1, as well as early indications of the effectiveness of EIP in overcoming inequalities.

Pupils' characteristics

To evaluate inequalities in attainment and progress we linked information on individual pupil's background characteristics to their assessment data. From the school records we derived information about pupils' sex, age, whether they had English as a second language (ESL), whether they were entitled to a free school meal, and the postcode of their home address. Free meal entitlement (FME) was used as a proxy for a relatively poor home background. From the postcode of home address we identified pupils who lived in areas of multiple deprivation using the Scottish Office index (Duguid 1995).

Inequality of attainment on entry to school

Analysis of Baseline Assessments confirmed that on entry to school pupils' levels of attainment varied considerably. The extent of inequality in reading and maths attainment is summarised by Table 1.The top half of Table 1 shows that younger pupils tended to have lower attainment than older pupils (-0.3 points for each month that a child's age was below the average for P1 pupils), and pupils with ESL had lower attainment than those for whom English was first language; the effect of having ESL was greater for reading than mathematics (-5.5 and -1.1 respectively).

The results in Table 1 confirm that pupils from relatively poor home backgrounds (indicated by the pupil having FME), and those living in areas of multiple deprivation, start school with lower than average reading and mathematics skills. It also shows that there is a further 'contextual' disadvantage in schools that have catchment areas with high proportions of pupils coming from poor home backgrounds (measured in Table 1 by percentage of pupils with FME attending each school). This contextual disadvantage reduces average baseline attainment of pupils on entry to school. All of these effects are cumulative, so a child will start school with reading attainment 8.2 points lower than average if s/he has a poor home background (-3.3), is living in an area of multiple deprivation (-2.1), and attends a school with a poor catchment in which 20% more pupils than average have FME (-2.8).

Relative Progress

We measure progress by comparing attainment at the end of P1 with baseline attainment at the beginning of P1. Factors affecting relative progress are summarised in the bottom half of Table 1. The concern of this analysis

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Table 1: Inequality in attainment and progress in reading and maths

Baseline attainment was lower if a child:	Average reduction in: Reading score	Maths score
• was younger than average;	-0.3 per month	-0.3 per month
• had English as a Second Language;	-5.5	-2.0
• had a relatively poor home background (indicated by FME);	-3.3	-4.0
• lived in an area of multiple deprivation.	-2.1	-1.8
• attended a school with a poor catchment (indicated by high % FME)	-1.4 per 10% of pupils in school with FME	-1.1 per 10% of pupils in school with FME
Progress was smaller if the pupil:	**Average reduction in progress**	
• had lower than average baseline attainment on entry to P1;	-1.3 per point below average of baseline attainment	-0.7 per point below average of baseline attainment
• had a relatively poor home background;	-1.5	0
• was male.	-1.1	+0.5

is the *relative progress* of disadvantaged pupils compared with their peers.

Inequality of pupils' progress

The most significant factor affecting attainment of reading at the end of P1 was the pupil's own baseline attainment in reading. A pupil whose baseline reading attainment was one point above the average at the beginning of P1 was likely to have a reading score 1.3 points above average by the end of P1. Conversely, a pupil whose baseline reading attainment was one point below the average at the beginning of P1 was likely to score 1.3 points lower in reading at the end of P1. In other words, pupils with high baseline attainment had made more progress in reading by the end of P1, and pupils with low baseline attainment had an even greater disadvantage.

In mathematics the relationship was different. There was some evidence of lower attaining pupils catching up with their peers in mathematics. A pupil whose baseline attainment was one point above average at the beginning of P1 had maths attainment at the end of P1 which was just 0.7 points above average. Conversely, a pupil whose baseline attainment in maths was one point below average, had attainment at the end of P1 just 0.7 points below average.

Pupils whose own home backgrounds were relatively poor started P1 with lower than average attainment and, in addition, they made less progress in reading (-1.5) during P1 than other pupils after taking account of baseline attainment. The disadvantage of the pupils' own home backgrounds was additional to the effect of having low baseline attainment. However, they made as much progress in mathematics as other pupils who had the same levels of baseline attainment.

Although pupils living in areas of multiple deprivation started P1 with lower than average attainment, there was no evidence that their progress differed from the progress of other pupils with the same levels of baseline attainment. All of the disadvantage of living in an area of deprivation was accounted for by baseline attainment. However, there was no evidence of catching-up by pupils from areas of deprivation.

Children with English as a Second Language (ESL) started P1 with relatively low attainment, but made as much progress as other pupils with the same levels of baseline attainment. There was no evidence of pupils with ESL catching up with the higher attainment of their peers in the course of P1.

There was no evidence of a 'contextual effect' of school intake characteristics on pupils' progress. Although baseline attainment was lower in schools that had high proportions of pupils coming from poor home backgrounds in their catchment areas, the progress of children in these schools during P1 was no different from the progress of other children with the same levels of baseline attainment.

Gender differences in attainment emerged during P1. At the beginning of P1 there was no difference between boys and girls in attainment of reading or mathematics. At the end of P1 boys had made less progress in reading than girls (-1.1), and more progress in mathematics (+0.5). These gender differences had emerged in the course of P1.

The effect of early intervention

The PIPS baseline assessments were carried out in term 1 at the start of the EIP, and subsequent PIPS assessments in term 3 were little more than seven months after the introduction of EIP. In this very short time-scale, we cannot expect major improvements in attainment of reading and mathematics.

However, it is very encouraging to find that there were small but significant gains in progress in reading in schools which were in Phase 1 of EIP. Whereas at the beginning of P1 the average baseline attainment of pupils in Phase 1 schools was no different from that of other pupils, at the end of P1 their average reading attainment was 4.3 points higher. (There was no difference in mathematics). It is also encouraging to find that in Phase 1 schools there is some evidence of

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catching-up in reading by pupils who started P1 with relatively low reading attainment. In future years of the evaluation it will be possible to include more detailed measures of the types of intervention adopted, and to evaluate the relative effectiveness of the approaches adopted.

Issues to be addressed by the EIP

The results of this analysis confirm that there are very substantial inequalities in the attainment of pupils when they enter P1. Concern about such inequality lies at the heart of the EIP, but until now the effect of inequality could not be quantified. For the first time in Scotland the PIPS data make it possible to quantify the effects of socio-economic inequalities on pupils at the beginning of their school careers and evaluate the effectiveness of early intervention in reducing such inequality.

The analysis suggests some factors which identify children who are at risk of underachieving at school. These include children who start school with low reading skills, those who are younger than average, those with ESL, those from relatively poor home backgrounds, those from areas of multiple deprivation, and those in the catchments of schools which draw most of their intake from poor homes. In some cases these factors are overlapping and create situations in which children face severe disadvantages on entry to school.

The major question to be addressed by the EIP is how schools can help overcome these disadvantages and ensure that pupils have opportunities to make progress in their learning and catch up with their peers.

Teachers are closer to the problems of underachievement than researchers or policy makers since they have daily contact with children's learning. Reflective teachers are therefore in the best position to develop interventions to help children make more progress. The EIP in Aberdeen City seeks to involve all early-years teachers in the development of improved methods of teaching and learning. It provides time for teachers to address these issues by reviewing existing practice, considering research evidence and developing new approaches to teaching and learning. However, there is need for further research and evaluation to support their work. In particular, we need more research on the influence of cultural and home resources, and ways of reducing the disadvantages associated with relatively poor home backgrounds.

The evidence of gender differences in attainment in P1 suggests the need for further research into the complex interaction of factors which influence the attitudes and attainments of girls and boys when they first start school. Although gender differences in examination attainment at secondary school and beyond have long been recognised, this analysis provides evidence that the problem arises as the beginning of children's school careers. We need further work to find methods of preventing underachievement by boys and girls in primary schools.

Further reading

Cowie M and Croxford L (1999) 'Using Baseline Assessment for Early Intervention', paper presented to the British Educational Research Association 1999 Conference, Edinburgh: CES.

Duguid G J (1995) 'Deprived areas in Scotland: results of an analysis of the 1991 Census', Edinburgh: The Scottish Office Central Research Unit.

Fraser H, Pirrie A and Croxford L (1999) National Evaluation of the Early Intervention Programme, *NEEIP Briefing 1*, Edinburgh: University of Edinburgh.

SOEID (1996) 'Improving Achievements in Scottish Schools', Edinburgh: the Stationery Office.

Further information

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About this study

This *Briefing* is based on an evaluation of the first year of the Aberdeen Early Intervention Programme. The programme seeks to improve attainment of literacy and numeracy in the first two years of primary school. The data on which the analysis is based are derived from PIPS standardised assessments, which were carried out at the beginning and end of P1 to provide information to teachers about the attainment and progress of their pupils.

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